



August 20, 2020

Utah Department of Environmental Quality
Division of Environmental Response and Remediation
195 North 1950 West
PO Box 144840
Salt Lake City, Utah 84114-4840

Attn: Mr. Kevin Beery
P: 801.536.4214
E: kbeery@utah.gov

RE: Soil Vapor Extractions Operations Data through August 17, 2020
Triple Stop Chevron, Inc.
1034 West Gentile Street, Layton, Utah
Facility ID No. 3000500, Release Site NUB
Terracon Project No. 61197153

Dear Mr. Beery:

As requested, Terracon Consultants, Inc. (Terracon) is pleased to provide operations data for the installed soil vapor extraction system (SVE) at the Triple Stop Chevron.

If you have any questions regarding this submittal, please contact us at (801) 545-8500.

Sincerely,
Terracon Consultants, Inc.

Curt Stripeika
Senior Project Manager
UST Certified Consultant #CC0003

Benjamin B. Bowers
Department Manager
UST Certified Consultant #CC0195

Attachments: Operations spreadsheet



Terracon Consultants Inc. 6949 South High Tech Drive Midvale, Utah 84047

P 801-545-8500 terracon.com

Environmental



Facilities



Geotechnical



Materials

1.0 INTRODUCTION

On February 14, 2019, Layton City reported petroleum odors in the basement of a home near the intersection of Gentile and Angel streets. This prompted an investigation initiated by the Utah Department of Environmental Quality (UDEQ). On February 16, two other homeowners reported gasoline vapors in their basements. Some of the residents voluntarily left their homes until abatement actions were initiated. To mitigate vapor intrusion for the several residences, ATC, an environmental contractor to the Utah Division of Environmental Response and Remediation (DERR), installed vapor mitigation blower systems at three of the homes in an effort to abate vapor concentrations around the homes.

Layton and UDEQ personnel began collection of water samples at various locations in the storm sewer downgradient of the Triple Stop Chevron, Inc. (herein referred to as Chevron) with impacts found as far as the outfall at Kays Creek, over 1 mile to the south of the Chevron. Additional investigation has included the advancement of soil borings, the installation of groundwater monitoring wells and sampling of the groundwater from the installed wells. Monitoring wells have been installed in the vicinity of the Chevron station and within the residential neighborhood just to the southwest of Chevron, on the south side of Gentile Street.

To investigate the structural integrity of the underground storage tanks (USTs) at the Chevron, two tank tightness tests and a tracer test were performed. The tests indicated that there was not an active leak within the system. A crack was found in one of the drop tubes from the spill bucket of the unleaded gasoline UST. The cracked drop tube has since been repaired.

A Corrective Action Plan (CAP) was developed by Terracon, dated February 6, 2020 to install a SVE system to remove, petroleum mass in the vapor phase and provide vapor mitigation for the storm and sanitary sewers located in Gentile and Sugar Streets. The system was installed under Workplan NUB-4 and is comprised of a leased Baker Furnace 300 cfm thermal oxidizer. The system was installed on Layton City property on the west side of Sugar Street, west of the Triple Stop Chevron. The SVE system is coupled to wells located on the Triple Stop Chevron property and within Gentile Street near the sanitary sewer alignment.

2.0 SVE SYSTEM AS-BUILTS

The system was installed in April and May of 2020. The As-Built Drawings are presented as an attachment to this letter report. Modifications were made for one of the wells located in Gentile street. An amended sheet C-2 shows the re location of SVE-2 from a location farther west near the UTA Right of Way to the northwest corner of Sugar Street and Gentile Street. The purpose is to focus the vacuum envelope closer to the source and impacted utilities.

Other modifications are the conveyance piping from the Triple Stop Chevron was bored under Sugar Street to the remedial compound. This was necessary due to time restraints working in the right of way making trenching across the road unfeasible. The original conveyance piping design to be trenched and called for a slope from the compound to the wells. Because of the depth of the bore the low point of the conveyance piping is at the north edge of the remedial compound. The low point of the piping is connected to sumps 4 inches in diameter and 4 feet deep for each SVE well that allows water condensate to flow toward the sump. An eight inch monitoring well vault was installed for each sump allowing access to the sump from the ground surface. All other specifications and design elements were adhered to as presented on the drawings.

3.0 OPERATIONS

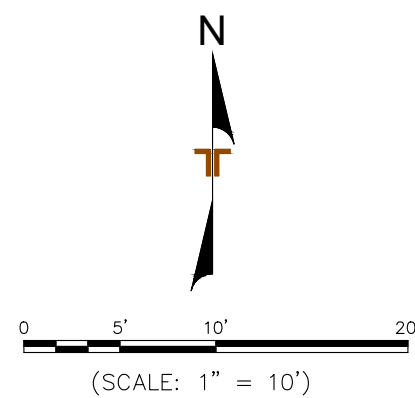
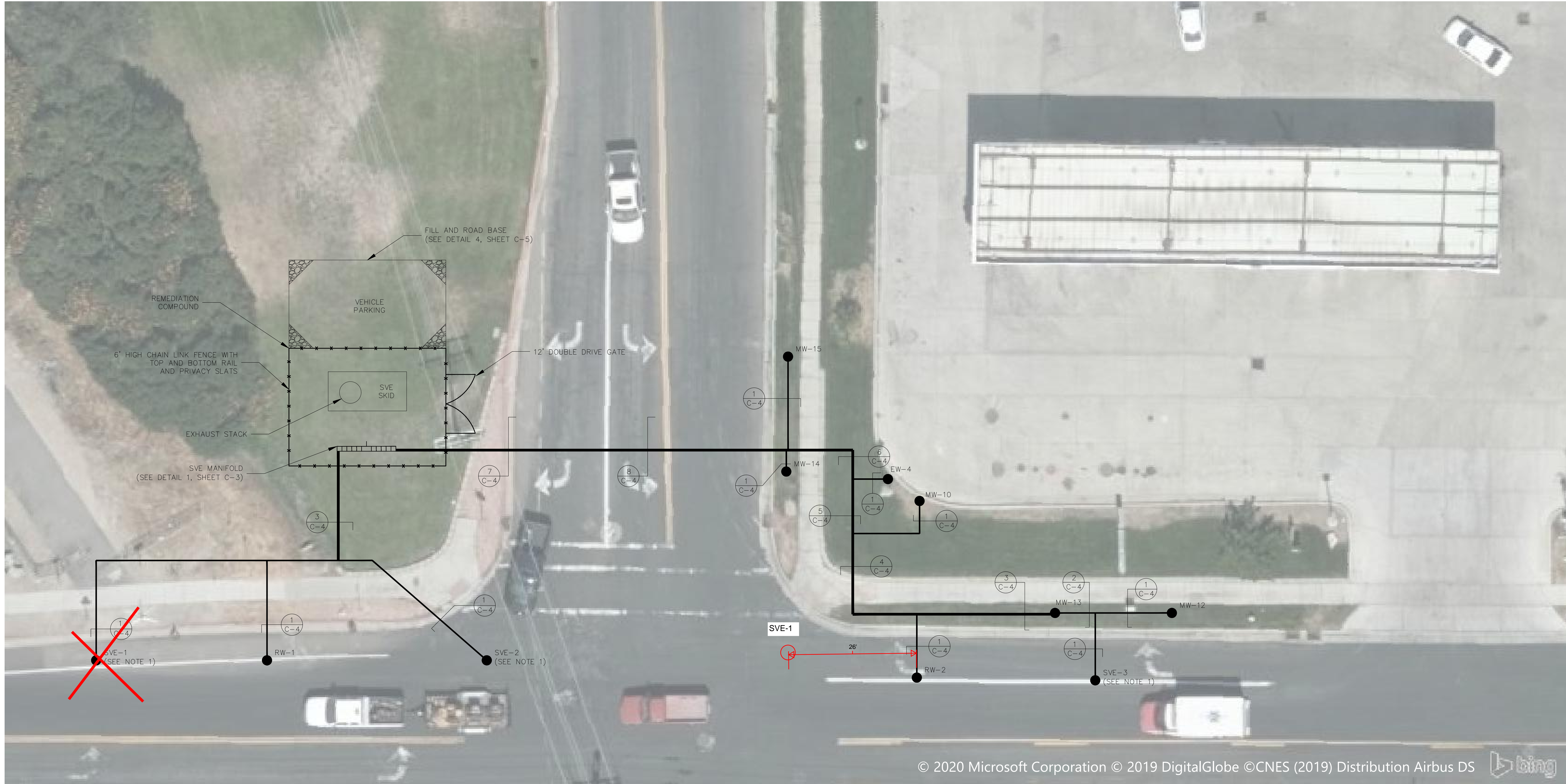
The system is operating under Utah Department of Air Quality (DAQ) under the Utah Small Source Exemption R307-401-9. A Notice of Intent (NOI) has been submitted to the DAQ dated July 31, 2020 which provides effluent analytical data and calculations of Hazardous Air Pollutants (HASPS) and total tonnage emissions. The data provides documentation that the system is meeting the Small Source Exemption. A copy of the NOI is attached.

The SVE system is intended to operate 24 hours per day, seven days per week. Operational problems occurred in late July with a High Limit Controller for the burner failed and required a replacement controller causing downtime of five days. On August 4 the system was shut down due to a process failure on inlet piping to the burner. The piping connection to the burner unit was modified and repaired by the SVE vendor on August 13, 2020 and restarted the same day.

The system was started on July 8, 2020. **Table 1** shows the operational history from that date. Weekly system checks are performed, and influent VOC concentrations are analyzed with a photoionization detector (PID), MiniRae 3000 calibrated to isobutylene. **Table 1** also presents an estimate of the VOCs removed in pounds and equivalent gallons. As of **August 17, 2020**, the system has recovered and thermally destructed **4,503 pounds or 726 gallons**.

AS BUILT DRAWINGS

N:\Projects - Other Offices\61197153 - Triple Stop Chevron\CAD DWGs - Terracon\61197153 SVE Design.dwg



NOTES:
1. WELLS SVE-1, SVE-2, SVE-3 WILL BE INSTALLED BY OTHERS PRIOR TO THE START OF CONSTRUCTION.
2. ALL WELLS CONSIST OF 2-INCH SCH 40 PVC EXCEPT EW-4 WHICH IS 4-INCH SCH 40 PVC.

- LEGEND
- SVE-X SVE WELL
 - RW-X RECOVERY WELL
 - EW-X EXTRACTION WELL
 - MW-X MONITORING WELL
 - x — FENCE

THIS DOCUMENT IS INTENDED FOR GENERAL USE ONLY AND IS NOT FOR CONSTRUCTION PURPOSES. LOCATIONS ARE APPROXIMATE.

REV	DATE	BY	DESCRIPTION

SVE SYSTEM LAYOUT
SOIL VAPOR EXTRACTION (SVE) SYSTEM
TRIPLE STOP CHEVRON
1034 WEST GENTILE STREET
LAYTON, UTAH 84041

Terracon
Consulting Engineers and Scientists
10625 W. 70 FRONTAGE RD. N., SUITE 3
PH: (303) 423-3300 FAX: (303) 423-3353
WHEAT RIDGE, CO 80033

Michael Davis Lane
PROFESSIONAL ENGINEER
No. 11030875-2200
MICHAEL DAVIS LANE
2/26/20
STATE OF UTAH

C-2
DESIGNED BY: RJR
DRAWN BY: EMA
APPVD. BY: CAS
SCALE: AS SHOWN
DATE: 02.19.2020
JOB NO: 61197153
ACAD NO: X
SHEET NO.: 4 OF 9

TABLE 1

Triple Stop Chevron
1340 West Gentile Street
Layton, Utah
Terracon Project No. 61197153
Facility ID 3000500, Release ID NUB

Date	ΔT Elapsed Time (Hr)	Hour Meter	Tech	ppmv	μg/L	Inlet Vacuum ("w.g.)	Inlet Vacuum ("Hg)	Inlet Flow (cfm)	Inlet Temp (°F)	Inlet Pressure (psia)	Inlet Flow (scfm)	Mass Rate (Lbs/Hr)	Lbs per ΔT	Cummulative (Lbs)	Cummaulative Gallons	Notes
7/8/20 0:00		3571.1	CAS	1500	7481.3	10	0.74	185	75	14.34	174.74	4.89	126.63	0	0	Start up
7/9/20 14:45	25.90	3597	CAS	1620	8079.8	10	0.74	184	74	14.34	174.28	5.27	770.52	771	124	Operating
7/15/20 13:30	146.30	3743.3	RM	1360	6783.04	10	0.74	184	75	14.34	173.80	4.41	596.10	1367	220	Operating
7/21/20 4:40	135.20	3878.5	RM	1360	6783.04	10	0.74	184	74	14.34	174.28	4.42	7.07	1374	222	Shut down
7/27/20 14:36	1.60	3880.1	CAS	4871	24294.3	10	0.74	179	74	14.34	169.55	15.41	2866.98	4241	684	Replace Hi Limit Controller, Start
8/4/20 8:45	186.10	4066.2	RM	869	4334.16	11	0.81	178	72	14.30	168.91	2.74	114.18	4355	702	Shut Down repair process inlet
8/6/20 8:21	41.70	4107.9	RM	877	4374.06	11	0.81	178	80	14.30	165.17	2.70	8.65	4364	704	Lube Blower, oil change
8/6/20 11:35	3.20	4111.1	RM	877	4374.06	11	0.81	178	80	14.30	165.17	2.70	0.00	4364	704	Shut Down repair process inlet
8/10/20 12:45																Try to restart, burner not lighting, pressure switch
8/13/20 15:23	0.00	4111.1	JG													System repaired , restart
8/17/20 12:25	94.70	4205.8	RM	477	2379.05	11	0.81	178	80	14.30	165.17	1.47	139.18	4503	726	Operating

Note: % LEL, field measured as methane and converted to gasoline by multiplying by 2.6

ppmv calculated using 13,000 ppmv = 100 % LEL for gasoline

For gasoline we used a molar weight of 120g

Inlet flow converted to SCFM follwing Dwyer Bulletin A-27, "Flow Correction Equations"

DAQ NOTICE OF INTENT



July 31, 2020

Utah Department of Environmental Quality
Division of Air Quality
195 North 1950 West
PO Box 144820
Salt Lake City, Utah 84114-4820

Attn: Mr. Bryce Bird
P: 801.536.4000
E: bbird@utah.gov

**RE: Notice of Intent (NOI)
Petroleum Hydrocarbon Remediation
Operation of a Soil Vapor Extraction with Thermal Oxidation
Triple Stop Chevron
1034 West Gentile Street, Layton, Utah
Facility ID No. 3000500, Release Site NUB
Terracon Project No. 61197153**


Dear Mr. Bird:

Terracon Consultants, Inc. (Terracon) is operating a remedial system composed of a soil vapor extraction unit coupled to a thermal oxidizer for off-gas treatment. Exhibit 1 shows the location of the site and Exhibit 2 shows a process and instrument diagram of the system. The equipment is leased from Pure Effect Environmental of CA. The system began operation on July 8, 2020. The intent of the system is for vapor mitigation and mass removal at the Triple Stop Chevron in Layton in response to a 23,000-gallon release. Included in this notice are a copy of the analytical data collected on July 15, 2020, and the estimated emission rates based on real-time process flow data.

If you have any questions regarding this submittal, please contact us at (801) 545-8500.

Sincerely,
Terracon Consultants, Inc.


Curt Stripeika
Senior Project Manager
UST Certified Consultant #CC0003


Bob Roth, P.E.
Authorized Project Reviewer

Attachments: Form 16, Form 3, HAPS worksheet, Process Instrumentation Diagram, Site Layout, Analytical report



**Utah Division of Air Quality
New Source Review Section**

**Form 16
Soil/Groundwater
Hydrocarbon Remediation**

Consulting Company: Terracon Consultants

Address: 6949 High Tech Drive
Midvale, Utah

Telephone Number: 801 746 5484

Fax Number: _____

Source Number: _____

Date: July 28, 2020

Contamination Information

1. Initial location of contamination (include address):

1034 West Gentile Street

Layton, Utah

2. Amount of material contaminated (cubic yards or
tons of material being handled):

22,000 gallon gasoline release

3. Specific compounds contained in hydrocarbon contamination (list each by name, relative percentage of total and
volatility rate or vapor pressure:

Name Gasoline

% of Total 100

Vapor Pressure _____

Maximum lb/ton or _____

Concentration ppm 5000 ppm

Process Information

4. Remediation will be performed: ☐ On location ☒ In-situ ☐ Excavated

☐ Excavated and transported to a new location

5. Type of unit/method used for remediation:

☒ Soil vapor extraction

☐ Biodegradation

☐ In-situ leaching

☐ Soil aeration (land farming)

☐ Asphalt Incorporation

☐ Groundwater stripping

☐ Excavation

☐ Thermal Treatment

☐ Other _____

6. Attach flow diagram and site plan of process:

Soil Vapor Extraction

7. Fan/blower requirements:

10 hp

300 ft³/min

8. Exhaust gas flow rate:

Design maximum: 200 acfm at 70 °F

Average expected: 184 acfm at 70 °F

9. Heater fuel: ☐ electric

☐ propane

☐ kerosene

☐ other Natural gas

10. Air flow control valves: ☒ Yes ☐ No

11. Stack height: 20 feet

Stack diameter: 18 inch

Stack gas exit temperature: 1550 F

12. Expected concentration flow
rate (grams/sec): NA

13. Pressure gauges: ☒ Yes

☐ No

14. Flow meters: ☒ Yes

☐ No

15. Attach discharge monitoring plan.

**Soil/Groundwater Hydrocarbon Remediation
Form 16 (Continued)**

Biodegradation

- | | |
|--|---|
| 16. Kind of nutrients added to soil: _____ | 17. Water flow rate: _____ acfm |
| 18. Pump requirements: hp _____ ft ³ /min _____ | 19. Number of wells: ____ Recovery ____ Injection |

In-situ Leaching

- | | |
|---|--|
| 20. Surfactant used: _____ | 21. Pump requirements: hp _____ ft ³ /min _____ |
| 22. Leachate flow rate:
Design maximum: _____ acfm
Average expected: _____ acfm | 23. Number of monitoring wells: _____
_____ |
| 24. Describe treatment of leachate: _____

_____ | |

Thermal Treatment

- | | |
|--|--|
| 25. Type of equipment: <input type="checkbox"/> Rotary kiln <input type="checkbox"/> Rotary drier <input type="checkbox"/> Fluidized bed
<input type="checkbox"/> Low-temperature thermal stripper <input type="checkbox"/> Other _____ | |
| 26. Company performing the incineration: _____
Approval Order # _____ | 27. Incineration capacity (tons/hr, etc.): _____ |

Soil Aeration

- | | |
|--------------------------------------|---|
| 28. Site of Aeration: _____
_____ | 29. Dimensions of aerated layer: _____ length
_____ width _____ depth |
| 30. Type of soil: _____
_____ | 31. Method to be used to turn the soil and frequency of turning the soil: _____ |

Asphalt Incorporation

- | | |
|--|----------------------------|
| 32. Company using soil in asphalt: _____ | 33. Approval Order # _____ |
|--|----------------------------|

Groundwater Stripping

- | | |
|---|---|
| 34. Groundwater flow rate: _____ gals/min | 35. Type of treatment: <input type="checkbox"/> Packet tower
<input type="checkbox"/> Oil/water separator <input type="checkbox"/> Carbon adsorption
<input type="checkbox"/> Other _____ |
| 36. Exhaust flow rate: _____ | 37. Expected concentration flow rate (grams/sec): _____ |
| 38. Stack height: _____ Stack diameter: _____ Stack gas exit temperature: _____ | |
| 39. Attach discharge monitoring plan | |

**Soil/Groundwater Hydrocarbon Remediation
Form 16 (Continued)**

Excavation

40. Name of landfill being used: _____

Emission Controls

41. Type of control: ☐ Carbon Adsorption (Form 5) ☒ Afterburner (Form 3) ☐ Condenser (Form 7)
 ☐ Baghouse (Form 10) ☐ Wet Scrubber (Form 9) ☐ Cover
 ☐ Cyclone (Form 6) ☐ Other _____

42. Calculated emissions for this process:

PM ₁₀ _____ Lbs/hr _____ Tons/yr	PM _{2.5} _____ Lbs/hr _____ Tons/yr
NO _x _____ Lbs/hr _____ Tons/yr	SO _x _____ Lbs/hr _____ Tons/yr
CO _____ Lbs/hr _____ Tons/yr	VOC _____ Lbs/hr _____ Tons/yr
CO ₂ _____ Tons/yr	CH ₄ _____ Tons/yr
N ₂ O _____ Tons/yr	

HAPs 7x10⁻⁴ Lb s/hr (speciate) 3x10⁻³ Tons/yr (speciate) See attached Table 1

Submit calculations as an appendix. If other pollutants are emitted, include the emissions in the appendix.



Utah Division of Air Quality
New Source Review Section

Form 3
Afterburners

Company Terracon Consultants

Site/Source Triple Stop Chevron

Date July 28, 2020

Equipment Information

1. Provide diagram of internal components: See attached PID	2. Manufacturer: <u>Baker Furnace</u> Model no.: <u>300 cfm Thermal Oxidizer</u>
3. Combustion chamber dimensions: Length: _____ inches, Cross-sectional area: _____ square inches	4. Burners per afterburner: <u>1</u> at <u>750,000</u> BTU/hr each
5. Minimum operating temperature of combustion chamber: <u>1550</u> °F	6. Minimum retention time (seconds): <u>Unknown</u>
7. Heat exchanger used: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes: Describe heat exchanger:	8. Catalyst used: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes: Describe catalyst:
9. Stack dimensions: Height <u>16 feet</u> Diameter <u>18 inch</u>	

Waste Gases (At Maximum Continuous Production Rate)

10. Chemical composition <u>Gasoline vapor</u>
11. Afterburner exhaust temperature: <u>1550</u> °F Flow rate: <u>300</u> scfm

Auxiliary Fuel

12. Type: <input checked="" type="checkbox"/> Natural gas <input type="checkbox"/> Fuel oil <input type="checkbox"/> Used oil* <input type="checkbox"/> Coal <input type="checkbox"/> Diesel <input type="checkbox"/> Other: _____	
13. Maximum sulfur content: <u>NA</u> % by Wt	14. Fuel usage rate at maximum continuous production rate: <u>750,000 BTU</u>

Average Operation of Source

Maximum Operation of Source

15. Gas flow rate: <u>200</u> scfm	17. Gas flow rate: <u>300</u> scfm
16. Efficiency of afterburner: <u>99.99</u> %	18. Efficiency of afterburner: <u>99.99</u> %

Emissions Calculations (PTE)

19. Calculated emissions for this device	
PM ₁₀ _____ Lbs/hr _____ Tons/yr	PM _{2.5} _____ Lbs/hr _____ Tons/yr
NO _x _____ Lbs/hr _____ Tons/yr	SO _x _____ Lbs/hr _____ Tons/yr
CO _____ Lbs/hr _____ Tons/yr	VOC _____ Lbs/hr _____ Tons/yr
CO ₂ _____ Tons/yr	CH ₄ _____ Tons/yr
N ₂ O _____ Tons/yr	
HAPs <u>7x10⁻⁴</u> Lb s/hr (speciate) <u>3x10⁻³</u> Tons/yr (speciate) See attached Table 1	
Submit calculations as an appendix. If other pollutants are emitted, include the emissions in the appendix.	

Table 1
Triple Stop Chevron SVE System
1034 West Gentile Street
Layton, Utah
Facility ID 3000500, Release NUB

Parameter	Method	Sample Identifier		Process flow	Combustion Air	Oxidizer Discharge Rate	Mass Discharge Rate	
		Stack 7/15/2020						
		7/15/2020 14:01						
Volatile Organic Compounds (MS)		ppbv	µg/m ³	scfm	scfm	scfm	lbs/hr	tons/yr
Benzene	TO-15	0.200	0.639	184	40	224	5.36E-07	2.35E-06
Ethylbenzene	TO-15	0.200	0.867	184	40	224	7.27E-07	3.18E-06
m&p-Xylenes	TO-15	0.400	1.73	184	40	224	1.45E-06	6.35E-06
o-Xylene	TO-15	0.200	0.867	184	40	224	7.27E-07	3.18E-06
Toluene	TO-15	0.424	1.60	184	40	224	1.34E-06	5.88E-06
Naphtahlene	TO-15	0.630	3.30	184	40	224	2.77E-06	1.21E-05
TPH (GC/MS) Low Fraction	TO-15	200	826	184	40	224	6.93E-04	3.03E-03

To obtain lbs/hr the following equation was used
C = HAP concentration in µg/m³
Q = Flow scfm
HAP (lbs/hr)=CxQx(60min/1hr)x(1m³/35.3ft³)x(1g/1E10⁶µg)x(1lb/454g)
Combustion air was calculated by Intellishare

ANALYTICAL REPORT

July 28, 2020

Revised Report

Terracon - Salt Lake City, UT

Sample Delivery Group: L1240872
Samples Received: 07/17/2020
Project Number: 61197153
Description: Triple Stop Chevron

Report To: Curt Stripeika
6949 South High Tech Drive
Midvale, UT 84047

Entire Report Reviewed By:



Chris Ward
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Cp: Cover Page	1	¹ Cp
Tc: Table of Contents	2	
Ss: Sample Summary	3	² Tc
Cn: Case Narrative	4	
Sr: Sample Results	5	³ Ss
STACK 7/15/2020 L1240872-01	5	
Qc: Quality Control Summary	6	⁴ Cn
Volatile Organic Compounds (MS) by Method TO-15	6	⁵ Sr
Gl: Glossary of Terms	7	
Al: Accreditations & Locations	8	⁶ Qc
Sc: Sample Chain of Custody	9	⁷ Gl
		⁸ Al
		⁹ Sc

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



STACK 7/15/2020 L1240872-01 Air

Collected by
Roy McDonald

Collected date/time
07/15/20 14:01

Received date/time
07/17/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1513313	1	07/22/20 15:50	07/22/20 15:50	GLN	Mt. Juliet, TN

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Unless qualified or notated within the narrative below, all sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chris Ward
Project Manager

Report Revision History

Level II Report - Version 1: 07/24/20 10:47

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Benzene	71-43-2	78.10	0.200	0.639	ND	ND		1	WG1513313
Toluene	108-88-3	92.10	0.200	0.753	0.424	1.60		1	WG1513313
Ethylbenzene	100-41-4	106	0.200	0.867	ND	ND		1	WG1513313
m&p-Xylene	1330-20-7	106	0.400	1.73	ND	ND		1	WG1513313
o-Xylene	95-47-6	106	0.200	0.867	ND	ND		1	WG1513313
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1513313
TPH (GC/MS) Low Fraction	8006-61-9	101	200	826	ND	ND		1	WG1513313
(S) 1,4-Bromofluorobenzene	460-00-4	175	60.0-140		100				WG1513313

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3552325-3 07/22/20 15:08

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Benzene	U		0.0715	0.200
Ethylbenzene	U		0.0835	0.200
Naphthalene	U		0.350	0.630
Toluene	U		0.0870	0.200
m&p-Xylene	U		0.135	0.400
o-Xylene	U		0.0828	0.200
TPH (GC/MS) Low Fraction	U		39.7	200
(S) 1,4-Bromofluorobenzene	101			60.0-140

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3552325-1 07/22/20 13:45 • (LCSD) R3552325-2 07/22/20 14:27

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	3.75	3.61	3.72	96.3	99.2	70.0-130			3.00	25
Toluene	3.75	3.62	3.72	96.5	99.2	70.0-130			2.72	25
Ethylbenzene	3.75	3.75	3.79	100	101	70.0-130			1.06	25
m&p-Xylene	7.50	7.54	7.67	101	102	70.0-130			1.71	25
o-Xylene	3.75	3.71	3.76	98.9	100	70.0-130			1.34	25
Naphthalene	3.75	4.86	5.01	130	134	70.0-159			3.04	25
TPH (GC/MS) Low Fraction	203	252	255	124	126	70.0-130			1.18	25
(S) 1,4-Bromofluorobenzene				102	103	60.0-140				



Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



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